REMARKS

The instant Amendment B is responsive to the Final Office Action dated February 7, 2003. Amendment B is presented in the revised format authorized and described in *AMENDMENTS IN A REVISED FORMAT NOW PERMITTED*, signed January 31 and published in the *Official Gazette* on February 25, 2003.

This Amendment is being filed in conjunction with a Request for Continued Examination. Applicant respectfully submits that claims 1, 5, 6, and 18-29 as set forth herein patentably distinguish over the cited references, and respectfully request allowance of all claims.

The current status of the claims

Claims 1-2, 4-7, 9, and **11-15** stand rejected under 35 U.S.C. §102(e) as being anticipated by Ryan, Jr. et al. (U.S. Patent No. 6,244,727), or, in the alternative,

Claims 1-2, 4-7, 9, and **11-15** stand rejected under 35 U.S.C. §103(a) as being unpatentable over Ryan, Jr. et al.

Claims 1, 3, 5-7 and **9-17** stand rejected under 35 U.S.C. §102(b) as being anticipated by Dick et al. (U.S. Patent No. 5,636,057).

Claims 1, 3, 5-7, and **9-17** stand rejected under 35 U.S.C. §103(a) as being unpatentable over by Kulka (U.S. Patent No. 4,214,168).

Proposed drawing amendment

Proposed amendments to FIGURE **3** are submitted herewith. FIGURE 3 is amended to add the control module **30** a rheostat $\mathbf{R_x}$ that enables variable power application to the lamp **10** as a whole, and a voltage divider made up of resistances $\mathbf{R_1}$, $\mathbf{R_2}$ for conditioning power applied to the lighting unit **14D**. These additions are supported in the specification as originally filed at least at ¶ [0033], therefore, no new matter is added by the proposed amendment to FIGURE **3**.

Applicants have submitted the proposed amended drawing with the added rheostat $\mathbf{R_x}$ and voltage divider resistances $\mathbf{R_1}$, $\mathbf{R_2}$ as a formal replacement FIGURE **3** which complies with 37 C.F.R. § 1.84.

Amendment to the specification

The specification ¶ [0033] is amended to conform with the proposed amendments to FIGURE **3**. Specifically, the notation "(not shown)" is replaced in two places by references to the illustrated rheostat $\mathbf{R_x}$ and voltage divider $\mathbf{R_1}$, $\mathbf{R_2}$ components, respectively. Both a rheostat and a voltage divider were disclosed in the original specification ¶ [0033] and are well-known electrical components. Hence, no new matter is added by these amendments.

Claims 1, 5, and 6 patentably distinguish over the cited references

Amended **claim 1** calls for a variable angular distribution lamp including a substrate, first and second lighting units each including an LED and a lens element that interact to produce first and second lamp illuminations having different angular distributions, and a controller for energizing a selected lighting unit to produce a lamp illumination having a selected angular distribution. The controller includes first and second switches that are selectably operated to energize the selected lighting unit.

Ryan et al. discloses an LED-based outdoor display that includes a plurality of LEDs arranged in cells **10** connected to a control **56** that enables independent energizing of the LED cells **10** (Ryan col. 8 lines 1-10). Thus, Ryan discloses an addressable display employing LEDs, analogous to an addressable LCD display. As in a color LCD display, the addressable cells **10** of Ryan can have different color tints, to effect an addressable color display.

Ryan does not disclose or suggest a variable angular distribution lamp having first and second lighting units each having different angular distributions. There is no suggestion or motivation in Ryan to have the various LED cells **10** produce light having different angular distributions. Different angular distributions for the cells or pixels of a display would not be expected to be useful, and indeed would be detrimental, since the cells or pixels would then have different apparent intensities as viewed from a given vantage point.

Moreover, the addressable cells **10** of Ryan are not suitable for producing selectable lamp illuminations. This is because the cells **10** of Ryan are spatially separated from one another. As seen in FIGURES 1 and 7 of Ryan, the LEDs of each cell **10** are spatially separated on the illuminated sign **50** (apparently mislabeled **70** in FIGURE 7; see col. 7 line 33 to col. 8 line 7) to define

addressable spatial pixels of the signal or display **50**. Thus, selectably operating one or another of the addressable cells **10** of Ryan will not produce different lamp illuminations for the sign **50**; rather, such selective operating will effect lighting up different localized points (that is, pixels) of the sign **50**.

This is entirely different from operation of the lamps **10**, **40**, **50** of the present application. In the lamps **40**, **50**, the LEDs of each lighting unit are distributed essentially uniformly across the substrate so that lamp illumination produced by each lighting unit emanates from the substrate as a whole. In the lamp **10** of FIGURE 1, the LEDs of the lighting units **14A**, **14B**, **14C** are arranged in concentric circles about a center of the substrate **12**, with the lighting unit **14D** being a single LED positioned at the center of the substrate **12**. Hence, the lamp illumination produced by any of the lighting units **14A**, **14B**, **14C**, **14D** is centered on the center of the substrate **12**.

Dick et al. discloses a traffic signal light **10** with LEDs **12** coupled to lenses **22** (col. 3 line 59 to col. 4 line 20). The lenses for different LEDs **12** have different optical prescriptions. As seen in FIGURES 3, 8, 11, 14, and 17 of Dick, the lenses define regions (labeled by capital letters A, B, ... V) each having a particular angular distribution identified in Table 1 (col. 5). The regions are energized simultaneously to produce a complex angular distribution pattern conforming with a traffic signal lamp standard set forth by the Institute of Transportation Engineers (col. 5 lines 12-30 along with Table 1).

There is no suggestion or motivation in Dick to separately, selectably energize the regions to produce different lamp illuminations having selected angular distributions. Rather, all the regions are simultaneously energized to produce a lamp illumination with a non-selectable angular distribution. Indeed, selectability would be completely contrary to the express purpose of Dick, which is to produce "a light source in accordance with the requirements of the traffic signal light standard" (col. 1 lines 39-43).

In applying Dick, the Examiner points out that "inherently, the light sources of a traffic light would include light sources which are independently operated to alert a driver to stop, go, or to use caution." Presumably, this references the conventional red, yellow, and green lamps of a three-lamp traffic signal. However, these are three different lamps. A driver sees different lamps;

for example, when the traffic signal cycles from red to green, the driver sees the red lamp turn off and a different green lamp light up.

The present application is addressed to a single lamp comprising a plurality of LEDs on a substrate that are selectably energized to produce lamp illuminations with different angular distributions. A person switching any of exemplary lamp embodiments **10**, **40**, **50** between lighting units would see lamp illumination emanating from the same lamp before and after switching. The lamp illumination would simply change in angular distribution, e.g. spot size, responsive to a selected switching between lighting units.

Applicants further point out that the three lamps of a three-lamp traffic signal have the same angular distribution. The red, green, and yellow lamps are optimized to illuminate the same area of road in the vicinity of the controlled intersection. Thus, switching for example from red to green does not change the angular distribution of the traffic signal light output. Only the light color changes. Claim 1 as amended herein specifies selectable angular distribution.

Kulka also discloses a three-lamp traffic light, which however does not employ LEDs. The three lamps of the Kulka three-bulb traffic signal also inherently have the same, rather than different, angular distributions, so that the red, green, and yellow lights all illuminate the same section of roadway. Moreover, they are separate and distinct lamps, none of which produce lamp illumination having selectable angular characteristics.

In view of the above amendments and remarks, it is submitted that claim 1, as well as claims 5 and 6 that depend therefrom, patentably distinguish over the cited references. An early indication of allowance of these claims is earnestly solicited.

Claims 18-23 patentably distinguish over the cited references

Claim 18 calls for first and second sets of light emitting diodes with coupled lenses arranged on a substrate, the first and second sets of light emitting diodes and coupled lenses producing light with different angular distributions, the first and second sets of light emitting diodes being selectively energized by a control module to produce a spot light beam with a corresponding selected one of the first angular distribution and the second angular distribution.

The cited references do not disclose or suggest first and second sets of light emitting diodes that are selectively energized to produce light having different angular distributions.

Claim 19 calls for the first and second sets of light emitting diodes to be distributed substantially uniformly across the substrate, with the light emitting diodes of the second set being interspersed amongst the light emitting diodes of the first set. This claim reads upon the lamps **40**, **50** shown in FIGURES 4 and 5 of the present application.

In Ryan, each set, or cell **10**, of light emitting diodes is spatially separated from other cells to define an addressable display pixel. There is no interspersing of light emitting diodes of different cells. In Dick, the various regions of light emitting diodes are spatially separate. No region is distributed substantially uniformly across the substrate, but rather each region extends over a defined portion of the substrate. Kulka does not disclose light emitting diodes of any sort. The red, green, and yellow signal lamps of Kulka are spatially separated.

Claim 20 calls for the second set of light emitting diodes to surround the first set of light emitting diodes. This claim reads upon the lamp **10** shown in FIGURE 1 of the present application. This surrounding relationship between the first and second sets of light emitting diodes is not disclosed or suggested in the cited references.

Claims 21 calls for the control module to include a power input control, while claim 22 calls for the power input control to be a user-operable rheostat or variable voltage divider. Claim 23 calls for a voltage divider that conditions voltage applied to one of the first set of light emitting diodes and the second set of light emitting diodes. These claims are supported in the specification as originally filed at least at ¶ [0033].

In view of the above remarks, it is submitted that new claims 18-23 patentably distinguish over the cited references. An early indication of allowance of these claims is earnestly solicited.

Claims 24-29 patentably distinguish over the cited references

Claim 24 calls for at least three sets of light emitting diode devices disposed on a substrate, the light emitting diode devices of each set surrounding a center of the substrate, each set of light emitting diode devices producing light

having a selected angular light distribution, the angular light distributions of the at least three sets of light emitting diode devices spanning a range of angular light distributions. A control module selectively energizes the sets of light emitting diode devices to produce a light with selectable angular light distribution over the range of angular light distributions.

The cited references do not disclose or suggest these features. In Dick, groups of light emitting diode devices with different angular distribution characteristics coexist on a substrate, but the various groups are not arranged to be selectively energized. In both Ryan and Dick the light emitting diode devices of each group do not surround a center of the substrate. Rather, each group is disposed over a different area of the substrate, either as cells **10** in Ryan or as regions (A, B, C, and so forth) in Dick.

Claim 26 specifies that the substrate is a copper plate with wells for the light emitting diode devices. This claim is supported in the original specification at least at ¶ [0028].

Claim 27 calls for the light emitting diode devices of each set to be distributed essentially uniformly across the substrate. This claim reads upon the lamps **40**, **50** shown in FIGURES 4 and 5 of the present application. The cited references do not disclose or suggest such an arrangement of several sets of light emitting diode devices.

Claim 28 calls for the light emitting diode devices of the at least three sets to be arranged in concentric circles about the center of the substrate. Claim 29 additionally calls for a fourth set of light emitting diode devices consisting of a single light emitting diode device disposed at the center of the substrate. These claims reads upon the lamp **10** shown in FIGURE 1 of the present application. This concentric arrangement of sets light emitting diodes is not disclosed or suggested in the cited references.

CONCLUSION

For the reasons set forth above, it is submitted that all claims 1, 5, 6, and 18-29 patentably distinguish over the references of record. Accordingly, an early indication of allowance is earnestly solicited.

Respectfully submitted,
FAY, SHARPE, FAGAN,
MINNICH & McKEE, LLP

Scott A. McCollister
Reg. No. 33,961
1100 Superior Avenue, Seventh Floor
Cleveland, Ohio 44114-2518
(216) 861-5582

C:\DATA\GLO20080\GLO080AF.doc